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Rosuvastatin and Olmesartan improve inflammation and endothelial dysfunction in Rheumatoid Arthritis

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Background: Cardiovascular disease remains the leading cause of excessive morbidity and mortality in Rheumatoid Arthritis (RA). Atherosclerosis and RA share similar pathogenetic mechanisms. Rosuvastatin and Olmesartan improve inflammation and endothelial dysfunction in non-rheumatic patients but it has not yet been investigated in rheumatic patients.

Objective: To investigate the effects of rosuvastatin and olmesartan on inflammation and endothelial function in patients with rheumatoid arthritis.

Methods: Forty five RA patients fulfilling the 2010 Rheumatoid Arthritis classification criteria were randomized into 3 groups to receive 6 months treatment with rosuvastatin (10 mg/day, n=15), olmesartan (10 mg/day, n=15) and placebo (n=15) as an adjunct to existing stable antirheumatic drugs. Flow mediated dilatation (FMD) was assessed by AngiodefenderTM (Everest Genomic Ann Arbor, United States). Inflammatory measures included Disease activity score of 28 joints (DAS28), CRP and ESR, pro-inflammatory cytokines (TNF-α, IL-6 and IL-1), serum nitrite and adhesion molecules (ICAM-1 and VCAM-1) and levels of lipids were measured at baseline and after treatment.

Results: At baseline, all inflammatory measures, pro-inflammatory cytokines and adhesion molecules were elevated and endothelial function impaired among all the three groups. After 6 months of therapy, FMD increased by 67.1%, 44.1% and 6.1%, in the Rosuvastatin, Olmesartan and placebo groups respectively. DAS28 significantly reduced by 55.2%, 25% and 7.5%, in the rosuvastatin, olmesartan and placebo groups respectively. Both rosuvastatin and olmesartan significantly decreased serum CRP and TNF-α as compared with placebo. Rosuvastatin also significantly improved ESR, IL-6, ICAM-1and serum nitrite concentration after 6 months but olmesartan and placebo had no significant change in these measures. IL-1 showed insignificant changes in the both drug groups and placebo. Rosuvastatin produced significant reductions in total cholesterol and LDL cholesterol but there were no significant changes in the lipid profile in recipients of olmesartan and placebo. Olmesartan significantly reduced blood pressure compared with rosuvastatin and placebo. Significant negative correlation observed between FMD and IL-6 and TNF-α after treatment with rosuvastatin where as a significant inverse correlation was found between FMD and TNF-α after treatment with olmesartan.

Conclusion: First study to show that Rosuvastatin and Olmesartan improve inflammation and endothelial dysfunction in RA. Both rosuvastatin and olmesartan lowers the pro-inflammatory cytokines especially IL-6 and TNF-α which down regulates the production of CRP and NO and improves the inflammation and endothelial dysfunction. However, Rosuvastatin in addition also favourably impacted ICAM-1 and lipid abnormalities. In contrast, olmesartan has beneficial effect on blood pressure. Thus both rosuvastatin and olmesartan have anti-inflammatory and vasculoprotective effects in RA mediated through anti-proinflammatory cytokine action.

Biography

Nidhi Garg after B.Pharm had completed M.Pharmacy in pharmacy practice in 2008 and currently she is a doctoral research fellow in Department of Pharmaceutical Sciences and Drug Research, Punjabi University, Patiala. She has published more than 9 national and international publications in reputed journals and 18 national (IRACON) and international (EULAR, APLAR and ACR) conference proceedings. She also has two year teaching experience as a lecturer in pharmacy college. Last year she was invited for poster presentation on "*Nitric Oxide as a biomarker of disease activity and therapeutic response in Rheumatoid arthritis and Ankylosing Spondylitis*" at ACCP 2013, Haiphong, Vietnam. Presently she is working on cardiovascular diseases, stem cells and effective therapy in rheumatic patients.

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